REMARKS

Claims 1-22, 33, 34 and 45 are pending in the application. Claims 23-32, 35-44 and 46 have been cancelled as a result of an earlier restriction requirement. Applicants retain the right to file a divisional application drawn to these cancelled claims. By the foregoing amendment, claims 4, 5 and 18 have been amended. Pursuant to the June 12, 2003 Office Action, all claims stand rejected.

Claim Rejections – Section 112:

Claims 1, 4, 5 and 18 stand rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. Specifically, it is alleged that applicant's use of the phrase "ion-exchange type agents" is indefinite in that the addition of the term "type" renders an otherwsie definite expression indefinite. By the foregoing amendment, applicants have stricken the word "type" from the description of the antimicrobial metal ion-exchange agent in claims 4, 5 and 18. No amendment has been made to Claim 1 as the language objected to does not appear in Claim 1.

This amendment is not to be construed as limiting the scope of the claims or as having been made for the purpose of avoiding any art. Rather this amendment is being made for the sole purpose of clarification of the term as requested by the Patent Office. No new matter has been entered as applicants have merely deleted a word from a phrase that the Patent Office has stated is definite in the absence of that word.

In light of the foregoing amendment and discussion, applicants respectfully request that the rejection be withdrawn and the claims, as amended, be passed on to allowance.

Claim Rejections – Section 103: Trogolo et. al.

Claims 1-18, 22, 33 and 45 stand rejected under 35 USC §103(a) as being unpatentable over Trogolo et. al. (US 6,436,422). Trogolo et. al. is cited as showing combinations of antimicrobial agents, particularly those of the ion-exchange type, with hydrophillic materials and, optionally, a discoloration agent and the use thereof in the coating of, among other substrates, medical devices. The Patent Office asserts that while the reference is silent as to the aspect ratio, a difference in the aspect ratio, in the absence of evidence of criticality, would not

support patentability. In following it is asserted that Trogolo et. al. discloses similar microcapsules as desired by Applicants including sheets, fibers and cylinders and addresses Applicants' attention to Figure 1 and Col. 5 of Trogolo et. al. The Patent Office concludes that it would have been obvious to one skilled in the art to have modified the microcapsules (of Trogolo) to determine a suitable aspect ratio to achieve the desired results.

Applicants respectfully traverse the rejection and request reconsideration. The Patent Office has completely misconstrued the teachings and explicit wording of Trogolo et. al. Trogolo et. al. discloses hydrophillic coatings comprising a hydrophillic polymer and an antimicrobial agent and the use thereof in the coating of various substrates, including medical devices. These coatings are made by dissolving the polymer in an appropriate solvent and adding to the solution the antimicrobial agent or, conversely, blending the antimicrobial agent into the polymer and then dissolving the same in the appropriate solvent. In any case, and contrary to the assertions of the Patent Office, nowhere does Trogolo et. al. teach, suggest, mention or infer microcapsules or microencapsulation or the preparation of antimicrobial microcapsules as contemplated by the present invention. Figure 1 of Trogolo et. al. shows a cross-sectional cut out of a catheter which has been coated with the antimicrobial coating material claimed in that patent. It certainly does not show a particulate/microcapsule antimicrobial agent as claimed by the present invention.

The present invention is directed to novel antimicrobial agents comprising a particulate hydrophilic polymer particles of high aspect ratios having encapsulated therein certain antimicrobial active agents, especially silver zeolites. These particles have a high concentration of antimicrobial active agent and a small overall particle size, but of a high aspect ratio, so as to optimize their ability to be incorporated into other polymer matrices without, or with minimal, adverse impact upon the physical properties of the polymer matrix into which they are incorporated, or in some instanced enhanced impact on such porperties, while optimizing the likelihood that the particles will touch a surface of the article into which they are incorporated. This results in particulate materials wherein a multitude of individual antimicrobial active agent particles are dispersed in a small amount of a hyrdophilic polymer creating a large reservoir of antimicrobial active comprising all of the encapsulated antimicrobial active agent particles. Conceptually, this embodiment could be represented either by a peanut cluster where the peanuts corr spond to the zeolite particles for those embodiments having a high weight ratio of

antimicrobial agent to hydrophilic polymer or by pieces of a Nestle Crunch bar where the crispies correspond to the antimicrobial agent in those embodiments where the aforementioned weight ratio is lower: the peanut clusters or Nestle Crunch bar being further formed into a high aspect ration shape.

The selection of the specific form and aspect ratio in which the novel antimicrobial agent is used is in part determined by the application to which it is to be applied. For example, coatings would more likely employ smaller aspect ratio particles so that they do not protrude above or too far above the surface of the coating on and underlying substrate. In this respect, coatings for catheters to be inserted into a patient need to be as smooth as possible to avoid irritation in use. On the other hand, large molded parts, especially for use in a high water exposure environment, would use larger particles and aspect ratios so as to ensure a large reservoir of antimicrobial active materials as well as a greater likelihood that a portion of the particle would touch the surface. Additionally, as noted earlier, the larger particle size may also enhance the physical performance characteristics of the polymer into which they are incorporated. For example, fibers may enhance the structural strength and rigidity of the polymer article into which they are incorporated.

From the foregoing, it is clear that the particle size and aspect ratio are important. Generally speaking, the novel, particulate antimicrobial agents according to the present invention are not likely greater than about 3000 microns in their longest dimension and typically have an aspect ratio of at least 2 and preferably from about 4 to 100. These particles can be compounded into other polymers at high concentration to form masterbatches or at lower concentrations for commercial use in producing molded parts or they may be integrated into coatings for application to the surface of varoius substrates, etc. In most all instances, the encapsulated antimicrobial agent remains as discrete domains in the polymer matrix: although there may be some break-up of the particles, especially those of extremely high aspect ratio, during polymer processing. Regardless, by virute of the encapsulation of the antimicrobial active agent with the hydrophilic polymer prior to incorporation into, for instance, a non-hydrophilic matrix polymer for manufacturing molded parts, Applicants have surprisingly found that one is now able to provide a longer life and greater release of antimicrobial agent for overall markedly improved antimicrobial efficacy at the same loading, of antimicrobial active agent, for the non-encapsulated agents. In hydrophilic polymer matrices of varying hydrophilicity values, different

from that of the encapsulant material, the use of the microencapsulated materials enables one to more precisely control the release characteristics of the antimicrobial active in such matrices. The use of these novel additives provides better performance and a more controlled performance at a lesser cost. The higher aspect ratios as contemplated by the claims of the present invention increases the likelihood that some portion of the microencapsulated materials will touch the surface of a molded part, especially molded parts having thick cross-sections.

In view of the foregoing, it is clear that Trogolo et. al. is not related or pertinent, from a patentability standpoint, to the subject matter of the present invention. At best, a film prepared from the coating of Trogolo et. al. could be used as the stock material from which the high aspect ratio microencapsulated particles of the present invention are prepared (see page 16, lines 15-16). However, Trogolo et. al. do not suggest, infer or motivate one to so prepare the particulate antimcirobial agents as now claimed. Consequently, the rejection based on Trogolo et. al., should be withdrawn and the application passed on to early and favorable consideration.

Claim Rejections – Section 103: Trogolo et. al. in view of Michal et. al.

Claims 1-22, 33-34 and 45 stand rejected under 35 USC §103(a) as being unpatentable over Trogolo et. al. (US 6,436,422) further in view of Michal et. al. (US 6,287,285). Trogolo et. al. is cited for the reasons set forth above. It is noted that Trogolo et. al. do not disclose the use of a dopant, particularly a sodium nitrate dopant. Michal et. al. is cited as showing the use of nitroc-oxide donors, including sodium nitrate, as vasodialators in association with the use and implantation of medical devices. The Patent Office asserts that it would be obvious to have modified the composition of Trogolo et. al with a dopant, such as sodium nitrate, for the purpose asserted by Michal et. al. The alleged expected result being a microcapsule comprising a hydrophillic polymer, an antimicrobial agent and a dopant.

Applicants respectfully traverse the rejection and request reconsideration. As noted above, Trogolo et. al. have nothing to do with the preparation of a particulate, high aspect ratio microencapsulated antimicrobial agent. While the use of a nitric-oxide drug therapy, as taught by Michal et. al., in conjunction with the insertion of a medical device coated with the Trogolo et. al. coatings for the purpose of the relaxation of smooth muscles may, on its face appear appropriate, nothing would suggest or infer that the nitri-oxide agent could be incorporated into the hydrophillic polymer coating, that such a combination would provide th benefit or action

desired by the drug therapy application of such materials as taught by Michal et. al. or, more importantly, that it could enhance the antimicrobial efficacy of the antimicrobial coatings as now taught by Applicants. Indeed, the use of the nitric-oxide therapy taught by Michal et. al. is an intravenous therapy which causes the muscle tissue to relaxed so that the insertion of a medical device is easier and results in less trauma, as a result of the muscle relaxation, to the walls of the vessel into which it is inserted. If one were to do as suggested by the Patent Office, even assuming the level of the nitric-oxide doner were sufficient, the only muscle to be treated would be that which comes in contract with the medical device as it is being inserted. Consequently, the muscle tissue would not be relaxed prior to/contemperaneous with the insertion and, thus, the whole benefit of the nitric-oxide therapy would be too late for its intended purpose under Michal et. al. Regardless, it is clear that neither reference alone or in combination suggest, infer, motivate or teach the invention as presently claimed. Consequently, Applicants respectfully request that the rejection be withdrawn and the application, as amended above, be passed on to allowance.

Conclusion

By the foregoing amendments, the basis for the rejections of claims 1, 4, 5 and 18 under 35 USC 112 has been fully addressed. Similarly, in light of the arguments set forth above, particularly the clarification with respect to the teachings of Trogolo et. al., it is believe that the rejections under 35 USC 103(a) have been fully addressed and rebutted. Consequently, Applicants believe the claims, as now presented, are in proper form for allowance. Early and favorable reconsideration is respectfully requested.

Petition For Extension of Time

By this response, Applicants hereby petition for a three-month extension of time; thereby extending the response period from September 12, 2003 to and including December 12, 2003. Enclosed is payment of the Petition Fee in the amount of $475.00.

Fees

Enclosed is Credit Card Authorization in the amount of $475.00 as payment of the Petition Fee for the Petition for Three Month Extension of Time. No addition fees are necessary as no new claims have been added.

Applicants believe all matters raised in the Office Action have been fully addressed. Should there be any questions, please contact the undersigned, Applicant's attorney.

Respectfully submitted,

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